June 14, 1960 H. E. ALLEN 2,940,153

CONCRETE WALL FORM SECURING MEANS

Filed Aug. 9, 1957 3 Sheets-Sheet 1

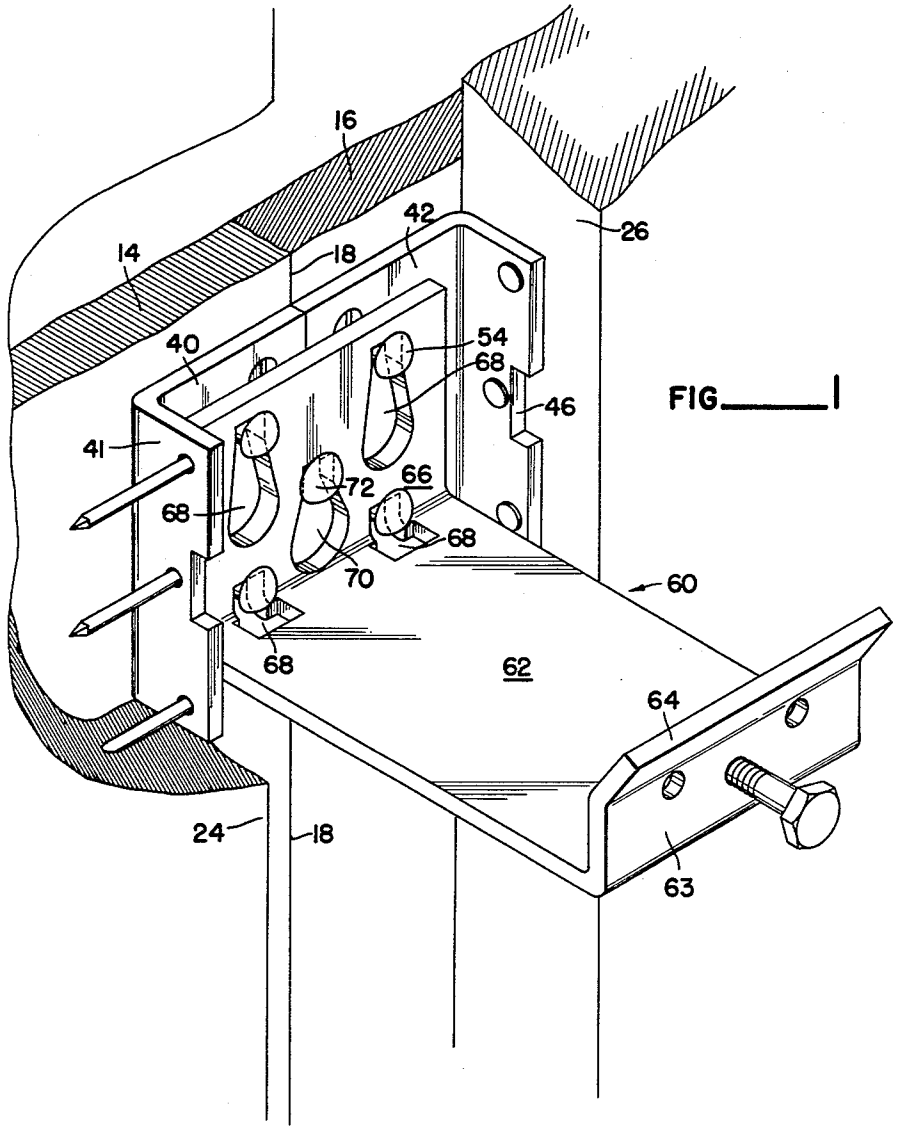


FIG. 1

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Filed Aug. 9, 1957 3 Sheets-Sheet 2

FIG. 2

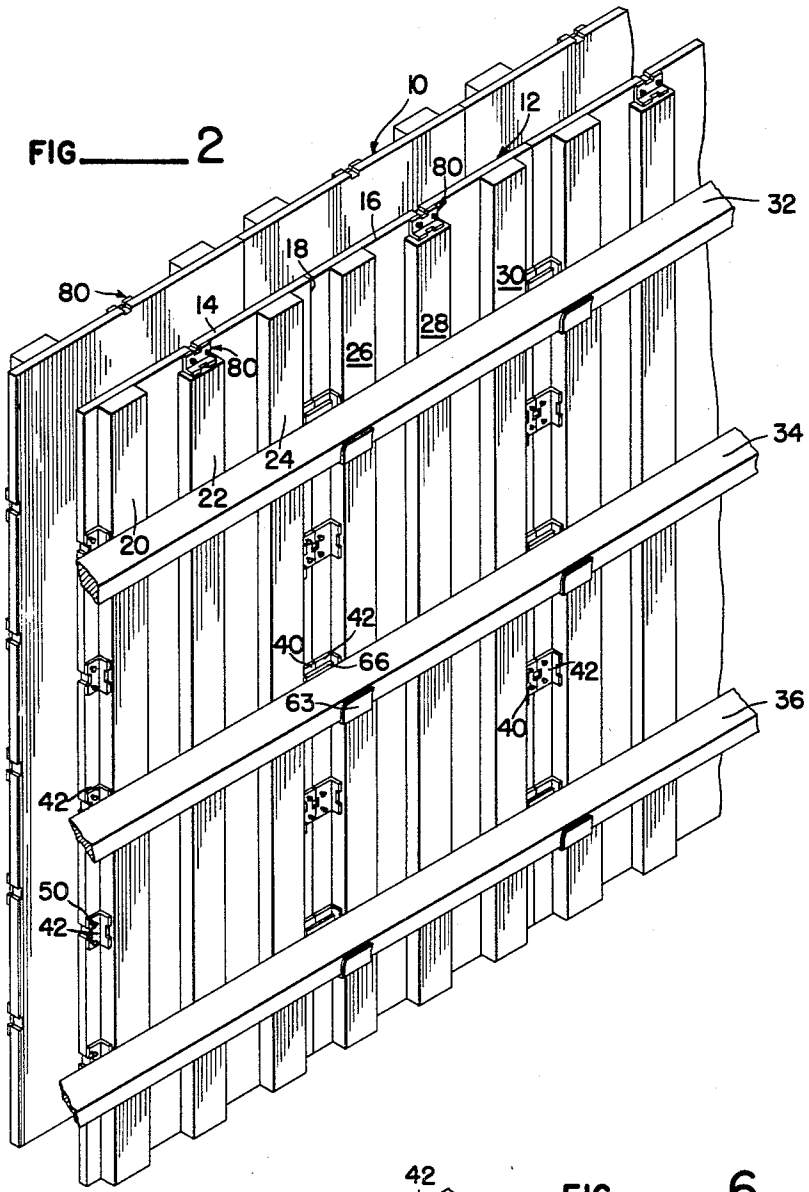
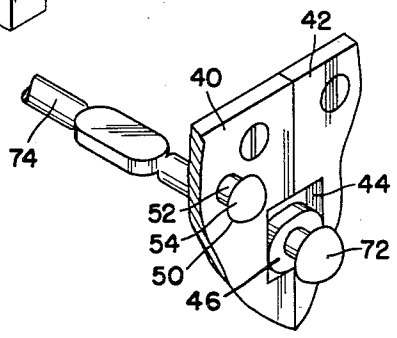


FIG. 6



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Filed Aug. 9, 1957 3 Sheets-Sheet 3

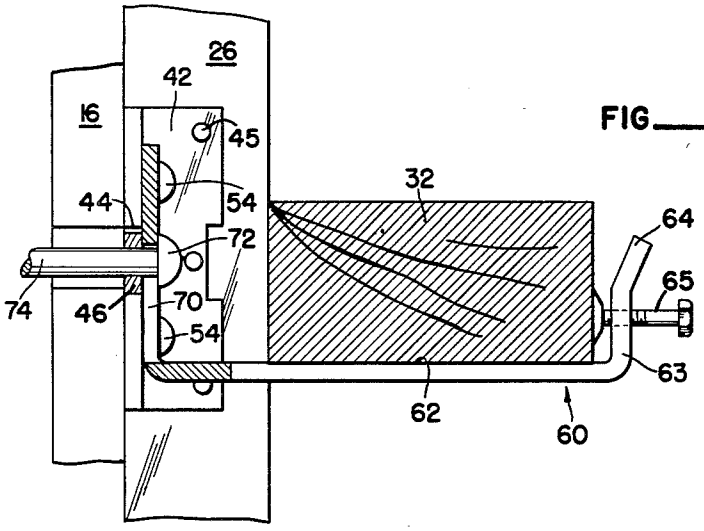


FIG. 3

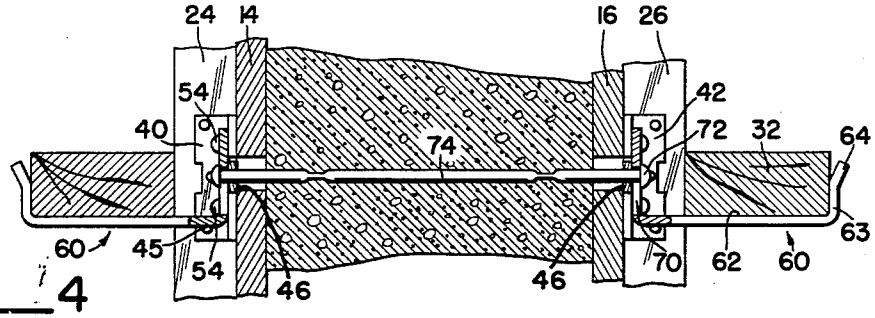


FIG. 4

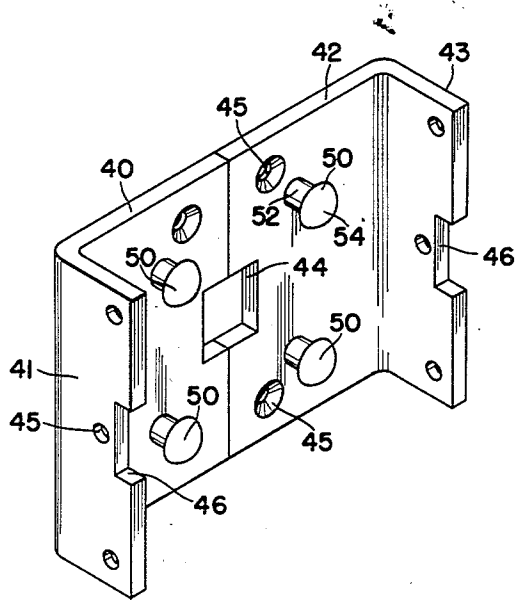


FIG. 5

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CONCRETE WALL FORM SECURING MEANS

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6 Claims. (Cl. 25—131)

This present invention relates to the general art of concrete wall form securing means and for use where relatively wide panels are used for the wall from elements. More particularly this invention relates to a means for supporting concrete wall forms in which the plywood panels particularly are employed. With these panels a plurality of vertical backing or studding members are employed. Wale pieces are placed horizontally outside of the vertical members in order to insure alignment of the various vertical studding members and to thus insure that the finished concrete wall faces will provide true plane surfaces. Metal bracket members are employed to facilitate the placement and particularly the securing, in position, of the various supporting wooden or metal studding or wale members to the end that the walls can be quickly set up and after the wall is poured the forms can be dismounted with a minimum of labor.

The use of plywood panels has become quite generally applied to concrete wall forms and this prevalent use has brought to the attention of construction people, that there are certain very definite problems raised through the use of the plywood panels. In old ship-lap walled concrete forms the lapping of the ship-lap and the staggering of the end joints practically precluded the leakage of concrete out through the forms. When plywood sheets are used, however, they are of large dimension and have a large area acted upon by the plastic, if not fluid, concrete when it is poured. This yieldable concrete tends to bow out the centers of the panels and particularly tends to spring the panels along their margins to the end that considerable difficulty has been experienced in producing concrete walls that were a true plane, a fact that was objectionable from appearance standpoint and more particularly from a contractor's point of view of using an excess amount of material.

This present invention is directed to means that insure that the margins are fixedly secured together during the pouring period. Convenient means are provided in addition as part of the bracket arrangement which insures the quick and accurate positioning of the vertical and horizontal supporting members employed in order to prevent any distortion of the plywood panels when subjected to the pressures exerted by the fluid concrete as it is being poured and further as aggrevated by the tamping or vibrating operations that are employed to insure a homogeneous mixture of the concrete aggregates.

A principal object of this present invention, therefore, is to provide means which will be convenient to place and economical in cost and which will insure the accurate alignment of the various plywood panels employed to form the wall surfaces of concrete forms used in building concrete walls.

A further object of this present invention is to provide metal bracket members which may be secured by nailing or screw fastening to the plywood panels near their margins and then adapted to be engaged by a second

part of the bracket assembly which will join together the two separate metal members on the original abutting plywood sheets to the end that the joints will be pressed together tightly and held in that position during the construction period.

A further object of this invention is to provide wale timber brackets which are formed as part of the clamping unit and thus the weight of the wale tends to hold the clamp means in position against vibration and the like.

A further object of this inventions to provide metal bracket assemblies which are so formed that they may be adapted to a wide variety of operational conditions.

Further objects, advantages and capabilities will be apparent from the description and disclosure in the drawings, or may be comprehended or are inherent in the device.

Figure 1 is a perspective view illustrating parts of a concrete wall form and the placement of the clamping and aligning bracket units.

Figure 2 is a perspective view illustrating a wall form, showing the two wall face forms and illustrating the means employed to back up the plywood sheets and prevent their distortion during the pouring operations.

Figure 3 is a vertical sectional view showing one form of using the bracket assembly of this invention.

Figure 4 is a vertical sectional view through the two walls of a concrete form and illustrating particularly the use of wales and the concrete form tie rods.

Figure 5 is a perspective view illustrating two of the coacting bracket members that are adapted to be secured to the plywood panels and their stiffening members.

Figure 6 is a fragmentary perspective view, partly in section, illustrating the means for positioning the concrete form tie rods.

Referring more particularly to the disclosure in the drawings, the numerals **10** and **12** designate the opposite faces of a typical form for the construction of a concrete wall. The actual facing material is preferably sheet material of considerable size. This may be built up from the various forms of fabricated boards or panels and for such use certain hard boards and metal may be employed. However, the preferred material among contractors at this time are plywood sheets. This material is readily available in all parts of the country and has unusual rigidity for its size and provides large smooth rectangular panel faces without any cracks. While my present equipment will accommodate plywood sheets in either a horizontal or vertical extending position, I have shown, as a preferred example the plywood employed with its longest dimension vertically disposed.

The various plywood sheets as **14** and **16** meet, in the arrangement as indicated in Figure 2, with vertical joints **18**. To stiffen the relatively large panels **14** and **16**, a plurality of studs disposed longitudinally to form panel stiffening members as **20**, **22**, **24**, **26**, **28** and **30** are employed. A preferred arrangement is to employ one of the stiffening members along the center line of a panel after the showing of members **22** and **28** and disposed near the margins of the panels similar stiffening members **20** and **24** for panels **14** and **26** and **30** for panel **16**. These members are preferably set back from the edge of the panel sufficiently so that a portion of the metal bracket assembly can be employed at several points along the margin of the panels. It will be apparent it is believed that even a reasonably large number of parallel stiffening members as illustrated in Figure 2 for instance will give uniform resistance to an applied load such as is occasioned when the fluid or plastic concrete aggregates are poured into forms made by the form wall members **10** and **12**. It has, therefore, been found very desirable to use wale timbers as **32**, **34**, **36** and the like.

These timbers should be selected with at least one straight edge and when these are suitably pressed against the vertical members or studding 20, 22, 24 and the like, alignment can be assured for the various panels 14 and 16 so that the interior surfaces of forms 10 and 12 will be true regular planes.

In all construction work particularly where high priced materials such as the heavy plywood, indicated in these present drawings, is used every endeavor must be made to recover the expensive panels after they are used to form one wall and use them in successive constructions. This reuse of the panel stock and the stiffening members indicates very clearly that no nailing must be permitted that will interfere with the dismounting of the forms after their instant use. This makes it very desirable to employ metal brackets, that will coact with each other to insure the rigidity and tightness required of the forms and yet admit the ready assembly, and particularly the easy dismounting of the forms without damage to the form materials.

A preferred bracket arrangement is illustrated particularly in Figure 1 and in various other views. The coacting, abutting clamp members 40 and 42 are preferably screw fastened to the edges of the plywood panels as 14 and 16. These are normally applied to the edges of the plywood panels by a jig or spacing arrangement so as to insure the interchangeability of the various panels and provide that the coacting clamp members as 40 and 42 of two abutting sheets be positioned so that they will coact as will be explained later in the securing and clamping of the panel edges together. Members 40 and 42 are shown most clearly probably in Figure 5 and it will be noted that these members as they abut provide a square opening as at 44 to position the centering washer 46 positioned on tie 74. It is for this reason that when the clamp members are secured to the plywood as by screws entering the screw holes 45 that their exact placement is very desirable. It will be noted that each member 40 and 42 has a right angle bend which provides the bearing surfaces as 41 and 43. These surfaces also have the screw openings 45 which facilitates nailing or screw fastening the bracket member to the edges of the stiffening members.

Clamp members 40 and 42 are provided with outwardly extending, headed detents 50. These are arranged with cylindrical portions as 52 and heads 54 which have a surface parallel to their supporting plate.

Attention is directed particularly to Figures 1 and 3 in which a wale bracket member 60 is shown. This member has a rest portion 62 and outer turned up portion 63 forming a wale guide which terminates in a marginal angled portion 64. A pressure screw 65 may be employed where the width dimension of waler 32 varies At its opposite end a second larger and turned up portion 66 forming a clamp face is provided. This portion is further pierced by 5 bayonet slots four of which, as 68 are arranged to engage the detent members 50. A fifth bayonet slot 70 is adapted to engage the headed end 72 of the form tie rod 74. In some instances it may be desirable that this slot engage a nut which may be threaded onto the tie rod 74 and of course time will be saved by being able to leave the nut threaded onto the tie rod instead of taking it off to pass the rod through a round hole. Tie rods as 74 are made in various types, however, it has been found that this bracket arrangement will normally be workable with the various types now readily available in the market.

If the large form facing sheets, as 14 and 16, are used in a horizontal arrangement, clamp members 40 and 42 are revolved 90°. With the detents 50 spaced equally in both directions wale brackets 60 may still be used as described.

To obtain maximum working advantage from any form equipment it is preferable to have the units shop prefabricated and to have the minimum of assembly in the field. To facilitate this procedure the clamp member as 40 or 42 secured to the margins of the plywood sheets and to the edges of the stiffening members as 20, 24, 26 and 28, thus securing the units together. For the central stiffeners 22 and 28, it is usually sufficient to employ one member 40 or 42 at each end of the stiffener as indicated at 80 in Figure 2. The facing sheets as 14 or 16 are then handled as a unit with their stiffeners and clamp members attached and this fabrication is not disassembled when the forms are demounted. Wale brackets 60 supply the joining and clamping means which hold the form members in place during the wall building. The wales assure alignment during the concrete pouring and setting period. In demounting the forms after the concrete has set, first the wales are removed and then the wale brackets 60 may be removed from detents 50 and the form facing sheets 14 or 16 may then be removed as a unit with their stiffeners attached.

In Figure 3 the usual placement of clamp members 40 and 42 is shown and in Figure 4 the mid-panel placement is shown. This use is where wide panels 14 or 16 are used and it is necessary to drill holes in the body of the panels for the form tie rods 74.

It is believed, that it will be clearly apparent from the above description and the disclosure in the drawings that the invention comprehends a novel construction of concrete form beams.

Having thus disclosed the invention, I claim:

1. A concrete wall form including vertically abutting rectangular form facing panels and vertical studding including studs adjacent the vertical margins of said panels stiffening said panels and comprising pairs of coacting clamp members each of the clamp members having a panel engaging face portion and a studding engaging portion disposed at right angles to said face portion, said clamp members having their face portion secured to the vertical margins of said panels and their studding engaging portion secured to said studs adjacent the vertical margins of said panels, wale brackets removably secured to said pairs of clamp members and securing the clamp members of said pairs of clamp members to one another, headed tie rods passing through said wall form, said wale brackets having a normally horizontal rest portion and means to receive a head of at least one of said headed tie rods to limit outward lateral movement of said wall form.

2. A concrete wall form as recited in claim 1 in which said panels are positioned with their longer dimension vertically disposed and said vertical studding includes intermediate studs positioned in the center of said panels and secured thereto at each end of said intermediate studs.

3. A concrete wall form as recited in claim 1 in which said face portion of said clamp members terminates in a face edge which defines a cutout portion forming one-half of a form tie rod positioning enclosure, and a washer disposed on said form tie rods seated in said enclosure.

4. A concrete wall form as recited in claim 1 in which said wale brackets are removably secured to said pairs of clamp members by means of outstanding headed detents secured to said face portion of said clamp members and interengaging with said wale brackets, said wale brackets each having an upturned clamp face at the inner end of said horizontal rest portion of said wale brackets, said clamp face being formed to define openings receiving and engaging the outstanding detents of a pair of coacting clamp members to secure the clamp members constituting said pair to one another.

5. A concrete wall form as recited in claim 4 in which said wale bracket has an upwardly directed wale guide securing flange at the outer end of said horizontal rest portion and said wale bracket includes adjustable pressure means adapted to engage the outer edge of a wale member as it is supported by said wale bracket to force

6. A concrete wall form as recited in claim 4 in which said wale members toward said panels.

said outstanding headed detents are constituted by a pair of outstanding headed detents secured to said face portion of each of said clamp members, said detents being positioned so that the detents of a pair of coacting clamp members are substantially equidistant vertically and horizontally, said openings defined by said clamp face being formed in the shape of bayonet slots and positioned to simultaneously receive and engage the detents of a pair of coacting clamp members, and said means to receive a head of at least one of said headed tie rods is constituted by an additional bayonet slot defined by said clamp face.

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